

MAGNETIC HEAD HAVING A WRITE COIL STRUCTURE WITH A REDUCED ELECTRICAL RESISTANCE FOR REDUCING THERMAL PROTRUSION

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ABSTRACT OF THE DISCLOSURE

Magnetic heads having write coil structures with reduced electrical resistances for reducing thermal protrusion are disclosed. In one illustrative example, a magnetic head includes a magnetic yoke; a write gap layer formed between upper and lower poles of the magnetic yoke; and a write coil having a plurality of coil layers. Each coil layer of the write coil extends continuously between the upper and the lower poles through a plane defined by the write gap layer. Preferably, the write coil is formed using a damascene process, such that each coil layer is wider than each coil separating layer. Such a structure provides for a relatively large amount of coil materials to be used, which reduces the coil's electrical resistance. This, in turn, reduces the heat generated by the write coils during operation. Further, either one or both of the lower and upper poles may include a horizontally laminated structure of alternating magnetic and non-magnetic dielectric layers to further reduce heating caused by eddy current losses. Since thermal protrusion is reduced, the fly height of magnetic head may be made relatively small with a reduced risk of head-to-disk crashes and disk scratches.